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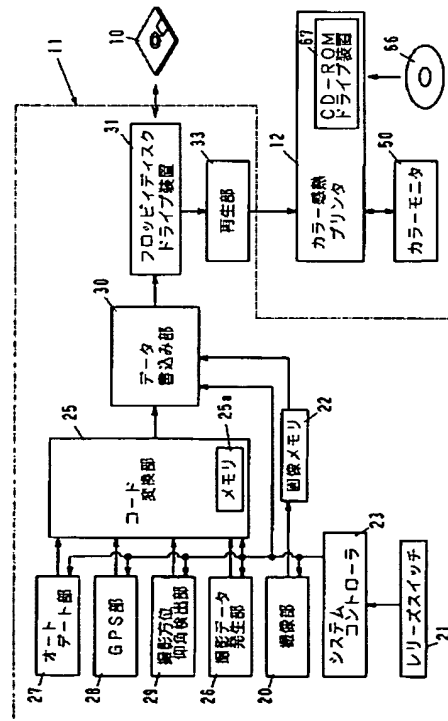
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(54) 【発明の名称】 撮影装置及び画像再現装置

(57) 【要約】

【課題】 カメラ側の構成を簡単にして、撮影地名等を撮影画像とともに記録又は表示する。

【解決手段】 スチルビデオカメラ11にグローバルポジショニングシステム(GPS)部28を設ける。このGPS部28により人工衛星からの信号に基づき緯度・経度情報を得る。この緯度・経度情報を撮影画像データとともにフロッピーディスク19に記録する。プリント時に、画像データとともに緯度・経度情報を読みだす。この緯度・経度情報に基づき地理データベースを検索して撮影地名を特定する。また、撮影方位仰角情報と撮影レンズの焦点距離情報に基づき被写体主題を特定する。ハードコピーに、撮影日時、撮影地名、被写体主題等の文字を記録する。



【特許請求の範囲】

【請求項1】 GPS信号により撮影の際の撮影位置を一義的に特定する撮影位置情報を検出する手段と、この撮影位置情報を記録媒体に書き込む手段とを備えたことを特徴とする撮影装置。

【請求項2】 撮影とともに少なくとも撮影レンズの焦点距離情報を記録するようにした撮影装置において、GPS信号により撮影の際の撮影位置を一義的に特定する撮影位置情報を検出する手段と、撮影の際の撮影方位を特定する撮影方位情報を検出する手段と、これら撮影位置情報と撮影方位情報とを記録媒体に書き込む手段とを備えたことを特徴とする撮影装置。

【請求項3】 撮影とともに少なくとも撮影レンズの焦点距離情報を記録するようにした撮影装置において、GPS信号により撮影の際の撮影位置を一義的に特定する撮影位置情報を検出する手段と、撮影の際の撮影方位及び仰角を特定する撮影方位仰角情報を検出する手段と、これら撮影位置情報と撮影方位仰角情報とを記録媒体に書き込む手段とを備えたことを特徴とする撮影装置。

【請求項4】 撮影とともに少なくとも撮影位置を一義的に特定する撮影位置情報を記録した記録媒体に基づき撮影した画像を別の記録媒体又は表示媒体に記録または表示する画像再現装置において、前記撮影位置情報から撮影地名を決定する手段と、求めた撮影地名を再現画像とともに記録または表示する手段とを備えたことを特徴とする画像再現装置。

【請求項5】 撮影とともに少なくとも撮影位置を一義的に特定する撮影位置情報、撮影レンズの焦点距離情報、撮影時の方位情報を記録した記録媒体に基づき撮影した画像を記録媒体又は表示媒体に記録または表示する画像再現装置において、前記撮影位置情報から撮影地名を決定する手段と、前記撮影レンズの焦点距離情報、撮影時の方位情報から被写体主題を特定する手段と、求めた撮影地名と被写体主題との一方または両方を再現画像とともに記録または表示する手段とを備えたことを特徴とする画像再現装置。

【請求項6】 撮影とともに少なくとも撮影位置を一義的に特定する撮影位置情報、撮影レンズの焦点距離情報、撮影時の方位仰角情報を記録した記録媒体に基づき撮影した画像を記録媒体又は表示媒体に記録または表示する画像再現装置において、前記撮影位置情報から撮影地名を決定する手段と、前記撮影レンズの焦点距離情報、撮影時の方位仰角情報から被写体主題を特定する手段と、求めた撮影地名と被写体主題との一方または両方を再現画像とともに記録または表示する手段とを備えたことを特徴とする画像再現装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、撮影とともに、撮影位置を一義的に特定する撮影位置情報、撮影時の方位情報や方位仰角情報などを記録して、画像を再現する際に、撮影地名や被写体主題などを再現画像とともに表示または記録するようにした撮影装置及び画像再現装置に関するものである。

【0002】

【従来の技術】撮影の際に、写真フィルムに、光源情報、日中シンクロ情報、撮影意図情報などの撮影情報を記録するようにしたカメラやこれを用いて写真プリントする方法などが提案されている（例えば特願平4-113347号公報）。また、人工衛星からの信号に基づいて現在位置を判定するグローバルポジショニングシステム（GPS）機能を有し、写真を撮影する際に日時や場所と一緒に記録するGPS内蔵カメラも提案されている（例えば特開平7-64169号公報）。

【0003】上記各種撮影情報を記録するカメラを用いることにより、各種撮影情報を活用してカメラの機能と感光材料の性能とを十分に発揮させた高品質プリントが得られるようになる。また、上記GPS内蔵カメラでは正確な撮影地名が撮影の際に記録され、写真プリントの際に撮影地名が合成されたプリント写真が得られるようになる。

【0004】

【発明が解決しようとする課題】上記GPS内蔵カメラでは、GPS機能から得られた緯度・経度情報に基づき、予め登録してある撮影地名を地理データベースから検索して、該当する撮影地名をカメラの表示装置に表示する。そして、この内容でよい場合に、所定のスイッチを操作することにより、撮影地名や撮影日時等の情報が記録されることになる。したがって、カメラ側に緯度・経度情報とこれに対応する撮影地名を関連づけた膨大な地理データベースを記憶しておく必要があり、必要とする記憶容量は膨大なものとなる。このため大容量の記憶装置が必要になるという問題がある。また、上記GPS内蔵カメラでは撮影地名を記憶するものであるから、撮影位置データを露光制御の補助や被写体主題の特定等に有効に利用することができないという問題がある。

【0005】本発明は、大容量の記憶容量を用いることなく、しかも、GPS機能に基づき、撮影した画面に撮影場所等を一緒に表示する他に、撮影場所、撮影方向、その他の撮影情報などを組み合わせて用いることにより、被写体主題や、撮影の際の太陽光の位置などを特定することができるようにした撮影装置及び画像再現装置を提供することを目的とする。

【0006】

【課題を解決するための手段】上記目的を達成するために、請求項1に記載した撮影装置は、GPS信号により撮影の際の撮影位置を一義的に特定する撮影位置情報を検出する手段と、この撮影位置情報を記録媒体に書き込

む手段とを備えたものである。また、請求項2記載の撮影装置は、請求項1記載のものに、撮影の際の撮影方位を特定する撮影方位情報を検出する手段と、この撮影方位情報と撮影レンズの焦点距離情報とを撮影位置情報とともに記録媒体に書き込む手段とを備えたものである。また、請求項3記載の画像再現装置は、撮影方位情報とともに撮影仰角情報も書き込むようにしたものである。また、請求項4記載の画像再現装置は、撮影位置情報から撮影地名を決定する手段と、求めた撮影地名を再現画像とともに記録または表示する手段とを備えたものである。また、請求項5記載の画像再現装置は、撮影位置情報から撮影地名を決定する手段と、撮影レンズの焦点距離情報、撮影時の方位情報から被写体主題を特定する手段と、求めた撮影地名と被写体主題との一方または両方を再現画像とともに記録または表示する手段とを備えたものである。また、請求項6記載の画像再現装置は、被写体主題を特定する際に方位情報の他に撮影仰角情報を用いるようにしたものである。

【0007】撮影の際に、例えばスチルビデオカメラでは、リリース操作により被写体画像がイメージエリアセンサにより撮像され、この画像データが例えばLSIカード等のメモリやフロッピーディスクの記録媒体に書き込まれる。また、この画像データの書き込みの他に、GPS機能による撮影の際の撮影位置を一義的に特定する撮影位置情報、例えば緯度・経度情報が、他の撮影日時情報や撮影レンズの焦点距離情報、撮影方位情報などとともに、撮影コマに対応させて記録媒体に記録される。撮影した画像を再現する場合、例えばスチルビデオカメラの場合には、まず、プリント対象コマの緯度・経度情報、撮影日時情報、撮影レンズの焦点距離情報、撮影方位仰角情報などが読みだされる。そして、緯度・経度情報に基づき撮影地名が特定される。次に、撮影方位仰角情報と撮影レンズの焦点距離情報から、例えば風景の主題として「富士山」、「北アルプス」などが特定される。これら撮影地名や被写体主題などは、画像データとともにディスプレイに表示される。そして、必要に応じて、カラー感熱プリンタ等のビデオプリンタを用いて、撮影したカラー画像が撮影地名入りで例えばカラー感熱記録材料にプリントされる。この場合には、地名の他に緯度・経度情報に基づき特定した撮影住所などを記録してもよい。また、8ミリビデオカメラで、緯度・経度情報などを記録してもよい。特に、スチルビデオカメラや8ミリビデオカメラの場合に、編集やハードコピーの作製を撮影者が行うことにより、GPS機能による撮影位置情報及び撮影方位情報から被写体主題を特定する場合にその特定が容易になる。

【0008】

【発明の実施の形態】図1は、フロッピーディスク10を用いて、画像データとともに各種撮影情報を記録するようにしたスチルビデオカメラ11と、このスチルビデオ

カメラ11で撮像したデータを用いて撮影地名入りの画像をプリントするカラー感熱プリンタ12とからなる画像再現システムを示す機能ブロック図である。スチルビデオカメラ11の撮影部20は周知のように、撮像光学系とカラーイメージエリアセンサとから構成されており、リリーススイッチ21の操作により、被写体を撮像して、これを画像メモリ22に記憶する。また、撮影に際しオートフォーカス機構によって焦点調節が行われる。

【0009】撮像部20及び画像メモリ22はシステムコントローラ23によりシーケンス制御される。システムコントローラ23は周知のマイクロコンピュータから構成されており、リリーススイッチ21の操作により各部をシーケンス制御して、撮像を行うとともに、撮像データとともに、各種撮影データをフロッピーディスク10の磁気記録層に記録するようになっている。図2にシステムコントローラ23における処理手順のフローチャートを示す。

【0010】コード変換部25には、撮影データ発生部26、オートデート部27、GPS部28、撮影方位仰角検出部29が接続されており、これらにより各種撮影情報が入力される。撮影データ発生部26は、図示しない各種センサやシステムコントローラ23から得られた信号により、光源種情報、ストロボ発光情報、撮影レンズの焦点距離情報を発生する。オートデート部27は、コード変換部25に撮影日時情報を送る。

【0011】GPS部28は撮影位置情報としての緯度・経度情報をコード変換部25に送る。GPS部28は、周知のように、少なくとも3個の人工衛星からの信号に基づき現在位置を、緯度・経度上の数値として数値データ化する。このGPS部28は、車載用のナビゲーションシステムに採用されているものと基本的に同じである。近年このGPSを用いたナビゲーションシステムが普及したことにより、回路の集積化が進んでおり、極めて小型の回路規模でGPS部28をカメラに搭載することができるようになってきている。しかも、測定精度も地球上の全ての地点で約25m程度の判別能力を有しており、この点でも撮影位置を特定するのに好適である。

【0012】撮影方位仰角検出部29は周知のジャイロ機構により構成されている。このジャイロ機構はカメラの向き（方位）及び仰角を検出して、これを撮影の際の撮影方位仰角情報としてコード変換部に送る。

【0013】また、コード変換部25には、システムコントローラ23から撮影駒数が送られる。コード変換部25は、内蔵するメモリ25aに記憶されている所定のコード作成基準により各撮影駒毎に各種撮影情報を符号化して、これをデータ書込み部30に送る。データ書込み部30は、各駒の撮像データと撮影情報の符号化データとを、フロッピーディスクドライブ装置31に送る。

フロッピディスクドライブ装置31は、内蔵する磁気記録ヘッドを駆動してフロッピディスク10に所定のフォーマットで撮像データ及び撮影情報の符号化データを磁気記録する。なお、各駒の撮像データを記録する毎に撮影情報の符号化データも記録する代わりに、各駒の撮影情報をメモリ25aに記憶しておき、全ての撮像が終了した時点で又は撮影情報書き込み指令の入力があった時点で、フロッピディスク10に撮影情報の符号化データを書き込むようにしてもよい。

【0014】また、スチルビデオカメラ11には、再生部33が設けられている。再生部33は、フロッピディスク10に書き込んだ撮像データ及び撮影情報の符号化データを再生して、図3に示すように、これらを外部映像出力端子34、外部コントロール出力端子35、外部撮影情報出力端子36を介して、カラー感熱プリンタ12やパソコン等に出力する。

【0015】次に、上記スチルビデオカメラ11を用いて、カラー感熱プリンタ12によりハードコピーを作成する方法について説明する。図3に示すように、カラー感熱プリンタ12には、外部映像入力端子40が設けられており、この外部映像入力端子40とスチルビデオカメラ11の外部映像出力端子34とが接続される。また、スチルビデオカメラ11の出力端子35、36と、カラー感熱プリンタ12の入力端子41、42とを介して、スチルビデオカメラ11からコントロール信号及び撮影情報が入力される。

【0016】外部映像出力端子34から送り出されるNTSC信号は、カラー感熱プリンタ12のY/C分離回路43に取り込まれる。Y/C分離回路43は、NTSC信号を輝度信号(Y)と色信号(C)とに分離し、デコーダ44に送る。デコーダ44は、輝度信号(Y)と色信号(C)とを赤(R)、緑(G)、青(B)の3原色信号に変換し、A/D変換器46とセクタ47とに送る。

【0017】セクタ47は、通常再生モードでは端子(a)側にセットされ、フリーズモードでは端子(b)側にセットされる。セクタ47が端子(a)側にセットされると、画像データはエンコーダ48を介して外部映像出力端子49に送り出され、これに接続されたカラーモニタ50に再生中のスチルビデオ画像が表示される。フリーズモードでは、A/D変換器46で各色の色信号が量子化され、例えば階調数64のデジタル信号に変換された後、フレームメモリ51に書き込まれる。そして、この画像データがD/A変換器52及び端子(b)側にセットされたセクタ47を介してカラーモニタ50に送られる。前記フレームメモリ51は、3色の画像データをそれぞれに独立に1フレームずつ記憶する3つのメモリ部から構成されている。

【0018】コントローラ53は、通常のプリント時には3色のうち1色分の画像データをフレームメモリ51

から順次読み出し、これを画像処理部55に送る。画像処理部55は、色補正、濃度補正、雑音除去、輪郭強調などの各処理を行って、この処理後の画像データをプリント用バッファメモリ56に書き込む。

【0019】画像処理部55では、周知のマトリクス演算式を用いて色相補正を行う他に、R、G、Bからシアン(C)、マゼンタ(M)、イエロー(Y)への色変換も行う。この色相補正により、カラー感熱記録材料57の分光特性と、スチルビデオカメラ11の分光感度との違いが補正される。また、画像処理部55では、ガンマ補正、コントラスト補正等の階調補正が行われ、これにより、撮像系の被写体の刺激値が濃度信号に変換されるとともに、カラー感熱記録材料57に応じた適正な階調度を持つようにされる。また、画像処理部55は、周知のように、線型フィルタリング回路や論理フィルタリング回路を用いて、雑音除去のための重みつき平均などの演算や、境界をぼかさない雑音除去である中間値フィルタリング等を行う。更に、周知の輪郭強調演算式に基づき、対象とする画素と、この周囲にある画素との画像データとにより、輪郭強調処理も行う。

【0020】コントローラ53は周知のマイクロコンピュータからなり、キーボード60とディスプレイ61とが接続されている。これにより、各種モードの設定や入力が行えるようになっている。

【0021】スチルビデオカメラ11からの撮影情報は、端子35、41を介してコントローラ53に送られる。コントローラ53は、撮影情報の内、撮影日時情報、緯度・経度情報及び撮影方位仰角情報を地名検索部65に送る。地名検索部65は、緯度・経度情報から、撮影位置を特定する。この撮影位置の特定は、緯度・経度情報と地名とを関連づけた位置情報データベースを用いて行われる。位置情報データベースは、CD-ROM66に記憶されて提供される。このため、地名検索部65にはCD-ROMドライブ装置67が接続されている。そして、緯度・経度情報により一義的に特定される地点から、この地点の属する地名が検索される。緯度・経度情報と地名との関連づけにおいて、行政上の住所を用いる他に、著名な観光スポットや、神社仏閣その他の建築物など(例えば「軽井沢」、「東京タワー」など)が緯度・経度情報から検索されるようにすることが好ましい。検索された地名データは、コントローラ53からの撮影日時情報とともに、画像合成部68に送られる。

【0022】画像合成部68は、地名及び撮影日時を表す文字像をビットマップ展開して、これをフレームメモリ50の文字データ書き込みエリアに書き込む。これにより、スチルビデオカメラ11からの画像と、撮影位置情報等の文字とを画像合成する。この合成画像は、カラーモニタ50で確認することができる。

【0023】プリント用バッファメモリ56からの画像データは1ラインずつラインメモリ70に書き込まれ

る。ヘッド駆動部 7 1 はこのラインメモリ 7 1 からの 1 ライン分の画像データに基づいてサーマルヘッド 7 2 を駆動する。サーマルヘッド 7 2 は周知のように、多数の発熱素子 7 2 a がライン状に配列されており、カラー感熱記録材料 5 7 を加熱して、三色面順次記録を行う。図 4 は、このようにして作製されたハードコピー 7 5 の一例を示す。このハードコピー 7 5 には、画像 7 6 と共に撮影日時及び撮影地名の文字像 7 7 とが記録されている。図 5 は、カラー感熱プリンタ 1 2 における処理手順を示すフローチャートである。

【0024】図 6 に示すように、カラー感熱記録材料 5 7 は、支持体 8 0 の上に、シアン感熱発色層 8 1、マゼンタ感熱発色層 8 2、イエロー感熱発色層 8 3、保護層 8 4 が順次層設されている。支持体 8 0 としては、不透明なコート紙又はプラスチックフィルムが用いられる。シアン感熱発色層 8 1 は、電子供与性染料前駆体と電子受容性化合物を主成分として含有し、加熱されたときにシアンに発色する。マゼンタ感熱発色層 8 2 としては、最大吸収波長が約 365 nm であるジアゾニウム塩化合物と、これに熱反応してマゼンタに発色するカプラーとを含有している。このマゼンタ感熱発色層 8 2 は、熱記録後に 365 nm 付近の紫外線を照射すると、未発色のジアゾニウム塩化合物が光分解して発色能力が失われる。イエロー感熱発色層 8 3 は、最大吸収波長が約 420 nm であるジアゾニウム塩化合物と、これと熱反応してイエローに発色するカプラーとを含有している。このイエロー感熱発色層 8 3 は、420 nm 付近の紫外線を照射すると光定着して発色能力が失われる。なお、光定着用の紫外線ランプは図示を省略してある。

【0025】なお、撮影データの緯度・経度情報を用いて撮影地名を特定する他に、地名検索部 6 5 及び被写体主題特定部 8 8 を用いて、図 7 に示すような処理手順により被写体主題も自動的に特定するようにしてもよい。この場合には、撮影データとして、緯度・経度情報の他に、撮影レンズの焦点距離情報、撮影方位仰角情報を利用する。そして、地理データベースの特定エリアを指定して、このエリアから望むことができる主要な被写体、例えば山、湖などをその方位仰角情報とともに登録しておく。先ず、被写体主題を特定することが可能な撮影場所か否かが緯度・経度情報から判定される。主題決定スポットに該当する場合には次のステップに進み、撮影レンズの焦点距離が所定の範囲にあるか否かが判定される。例えば、主題決定スポットに北方向に被写体主題となる山などが登録されている場合には、撮影レンズの焦点距離が無限大のときに、次のステップに進み、撮影方位及び仰角が所定範囲内か否かが判定される。そして、撮影方位が北を示す場合には、その山の名前、例えば「富士山」、「北アルプス」などが被写体主題として決定される。また、被写体主題のみならず、撮影日と撮影地名と組み合わせてもよく、例えば、「平成 7 年 8 月 2

0 日に北軽井沢から浅間山を望む」などの文を表す文字像がフレームメモリ 5 1 にビットマップ展開されて書き込まれる。また、各ステップで上記範囲内に該当しない場合には、撮影地名のみが決定される。撮影方位仰角情報としては、例えば北を「0」として、東、南、西の順に 360 度表示することにより方位が決定され、更にカメラの水平方向に対する傾き情報が仰角として決定される。このように撮影方位及び仰角を用いて被写体主題を特定するため特定精度を上げることができる。なお、被写体主題の特定は、撮影方位仰角情報の他に、特定精度は低下するものの、撮影方位情報のみ、又は撮影レンズの焦点距離情報と撮影方位情報を用いて特定してもよい。また、撮影時に高度情報を記録しておき、被写体主題の特定する際に高度情報も併せて用いるようにすると、被写体主題の特定精度をより一層上げることができる。

【0026】このように、スチルビデオカメラ 1 1 及びビデオプリンタ 1 2 を用いた撮像及び画像再現システムによれば、撮影位置や撮影日時等をその都度入力したり確認したりする必要がなくなり、即時性が要求される報道用として好適なものとなる。この場合に、カメラマンがビデオプリンタを操作することで、前記被写体主題の特定をより的確に行うことができるようになる。また、ビデオプリンタにおいて、撮影日時や場所を示す文字の合成が写真プリンタ等に比べて容易であり、より有効なものとなる。

【0027】前記地理データベースは、一般的な地名や行政上の住所に限らず、業務において特別に準備されているデータベースと組み合わせる用いるようにすることで、広汎な利用が可能になる。例えば、電力会社が有している高圧鉄塔の位置情報を登録したデータベースを用いることにより、メンテナンス用に撮影した鉄塔写真の識別を容易に行うことができる。更に、これに撮影方位仰角情報や高度情報などを用いることで、どの方向からの鉄塔写真かも識別することができ、よりメンテナンス等の業務が容易になる。

【0028】上記実施例ではスチルビデオカメラ 1 1 とカラー感熱プリンタ 1 2 との組み合わせからなるシステムとしたが、この他に、図 8 に示すような透明磁気記録層を備えた写真フィルムパトローネ 9 0 を用いたカメラ 9 1、及び図 9 に示すような写真プリンタ 9 2 に実施してもよい。この場合には、図 8 に示すようにリリースボタンの操作によりリリーススイッチ 9 3 を作動させて、撮影レンズ 9 4、シャッター機構 9 5、駆動部 9 6 を用いて写真フィルム 9 7 の感光乳剤面に被写体画像を露光するとともに、写真フィルム 9 7 の透明磁気記録層に磁気記録ヘッド 9 8 を用いて、撮影情報を磁気記録する。このため、システムコントローラ 100 は、オートデート部 101、GPS 部 102、撮影方位仰角検出部 103、撮影データ発生部 104、コード変換部 105、デ

ータ書込み部106を制御して、撮影日時情報、緯度・経度情報、撮影方位仰角情報、ストロボ発光情報、撮影レンズの焦点距離情報、被写体輝度情報等を撮影情報として透明磁気記録層に磁気記録する。

【0029】図9に示すように、写真プリンタ92では、周知のように、フィルムキャリア110にセットされた写真フィルム97のプリント対象コマを、光質調整された光源部111により照明して、この照明された写真フィルム97のプリント対象コマの画像を焼付レンズ112によりカラーペーパー113に焼付露光する。光源部111は、ランプ114と、三色フィルタ115、116、117を焼付光路118に挿入して光質調整するフィルタ駆動部119と、拡散ボックス120とから構成されている。また、周知のように、プリント対象コマを臨む位置にスキャナ121が配置されており、このスキャナ121はプリント対象コマの各点を三色分解測光する。この測光値は特性値算出部122に送られる。特性値算出部122は各種特性値を抽出する他に、周知のようにプリント対象コマをシーン分類してこのシーン分類結果に基づき露光補正量を算出する。特性値及び露光補正量は、露光量演算部123に送られる、露光量演算部123は周知の露光量演算式を用いた焼付露光量を算出し、これをコントローラ125に送る。コントローラ125はこの焼付露光量に基づき色フィルタ115～117の焼付光路118への挿入位置を算出し、これをフィルタ駆動部119に送る。フィルタ駆動部119はフィルタ挿入位置に各色フィルタ115～117を挿入し、焼付光の光質を調整する。光質調節した後に、シャッター駆動部126がシャッター127を一定時間開いて、プリント対象コマの画像をカラーペーパー113に焼付露光する。

【0030】フィルムキャリア110には磁気読取りヘッド130が設けられており、透明磁気記録層に記録された撮影情報を読み取る。デコーダ131は、撮影情報を写真プリンタ92で利用可能なデータ形式に変換し、これをコントローラ125に送る。コントローラ125には、CD-ROMドライブ装置132がセットされており、CD-ROM133に記憶された地理データベースを検索して、撮影位置及び必要に応じて被写体主題を特定する。この撮影位置等の特定は、コントローラ125に接続されたキーボード128及びディスプレイ129を操作することにより行われ、特定された撮影位置や撮影日時は、文字焼きコントローラ134に送られる。文字焼きコントローラ134は文字焼込みヘッド135をカラーペーパー113の送りに同期させて駆動することにより、撮影位置等の文字をカラーペーパー113にライン露光して、文字を焼き込む。また、露光補正データやコマ番号等は、裏印字コントローラ136に送られる。裏印字コントローラ136は裏印字ヘッド137を駆動して周知のようにカラーペーパー113の裏面にコ

マ番号や露光補正データを印字する。写真フィルム97の画像が焼付露光され、且つ撮影地名等が焼き込まれたカラーペーパー113は、ペーパーリザーバ140で一定量貯留された後に、ペーパープロセッサ141で現像処理され、各コマ毎に切断される。これにより図4に示すハードコピーと同じように撮影位置や撮影日時が焼き込まれたプリント写真が作製される。

【0031】なお、撮影位置を焼き込む他に、裏印字ヘッド137を用いて、図10に示すようにプリント写真の裏面140に、コマ番号141や露光補正データ142とともに、撮影位置や撮影主題、撮影日時等の文字143を印字してもよい。また、上記実施例では、写真フィルム97の透明磁気記録層に撮影情報を記録するようにしたが、これに代えて、パトローネ90と一体または別体で設けたLSIメモリやLSIカードに撮影情報を記録してもよい。また、緯度・経度情報をバーコード化して、対応する駒に光学的に記録してもよい。

【0032】また、ビデオプリンタとしてカラー感熱プリンタ12を用いたが、この他に、インクリボンを用いる熱溶融型や熱昇華型の記録方式や、インクジェット方式、レーザービーム方式など各種記録方式のビデオプリンタを用いることができる。また、スチルビデオカメラ11において、画像データ及び撮影情報は、フロッピーディスク10に磁気記録する代わりに、LSIカードなどに電子的に記録するようにしてもよい。

【0033】更には、静止画像を記録するスチルビデオカメラの他に、動画像と音声とを記憶するビデオカメラに実施してもよい。この場合には、ビデオデッキに、地名等の検索機能を付加して、撮影地名や撮影日時等を画像合成して、モニターに表示するとよい。また、文字の画像合成の他に、撮影地名や日時を音声合成して、これに対応する画像に記録するようにしてもよい。また、スチルビデオカメラは、デジタル画像データを出力するように構成したものでもよく、この場合には、周知の画像圧縮方式を用いて画像データが記録される。また、撮影位置の特定は、ビデオプリンタに組み込んだものを用いる他に、パソコン等を利用して行ってもよい。

【0034】また、写真フィルムを用いたシステムでは、撮影日時情報、撮影位置情報、撮影方位情報から、撮影時の太陽の位置を特定し、この太陽位置情報と撮影輝度情報とから太陽光に対する逆光撮影か否かなどを判定して、撮影した画像の濃度、色バランス補正を行うようにしてもよい。また、上記実施例では、撮影位置情報として、緯度・経度情報を用いたが、この他に撮影場所を一義的に特定できるものであればよく、例えば3次元の極座標データなどを用いてもよい。

【0035】

【発明の効果】本発明によれば、GPS信号により撮影の際の撮影位置を一義的に特定する撮影位置情報を求め、この撮影位置情報を記録媒体に書き込むようにした

から、撮影装置側で撮影位置情報に基づき地名等の特定を行うことがなく、カメラ側の構成を簡単にすることができる。しかも、撮影位置を一義的に特定することができる撮影位置情報を記録媒体に書き込んでおき、画像再現装置側で、撮影位置情報に基づきデータ処理を行うことができるようになる。したがって、地理データベースの情報量を少なく抑える必要がなく、精度のよい撮影地名の特定が可能になる。

【0036】また、撮影情報として、撮影位置情報の他に、撮影方位情報及び撮影レンズの焦点距離情報を用いることで、単なる撮影地名の特定の他に、被写体主題の特定なども可能になる。また、特定の建築物などの位置データを入力した地理データベースを用いることで、撮影位置情報及び撮影方位情報から、写した建築物などの特定、及びその撮影向き等を簡単に知ることができ、撮影の際にメモなどを記入する必要もなく便利になる。更に、撮影方位情報の他に撮影仰角情報を加えることで、被写体主題の特定精度を上げることができるようになる。

【図面の簡単な説明】

【図1】本発明を実施したスチルビデオカメラを示す概略図である。

【図2】同スチルビデオカメラにおける処理手順を示すフローチャートである。

【図3】本発明を実施したカラー感熱プリンタを示す機能ブロック図である。

【図4】ハードコピーの一例を示す正面図である。

【図5】カラー感熱プリンタの処理手順を示すフローチャートである。

【図6】カラー感熱記録材料の層構造を示す概略図である。

【図7】被写体主題を特定する処理手順を示すフローチャートである。

【図8】緯度・経度情報を記録するカメラを示す概略図である。

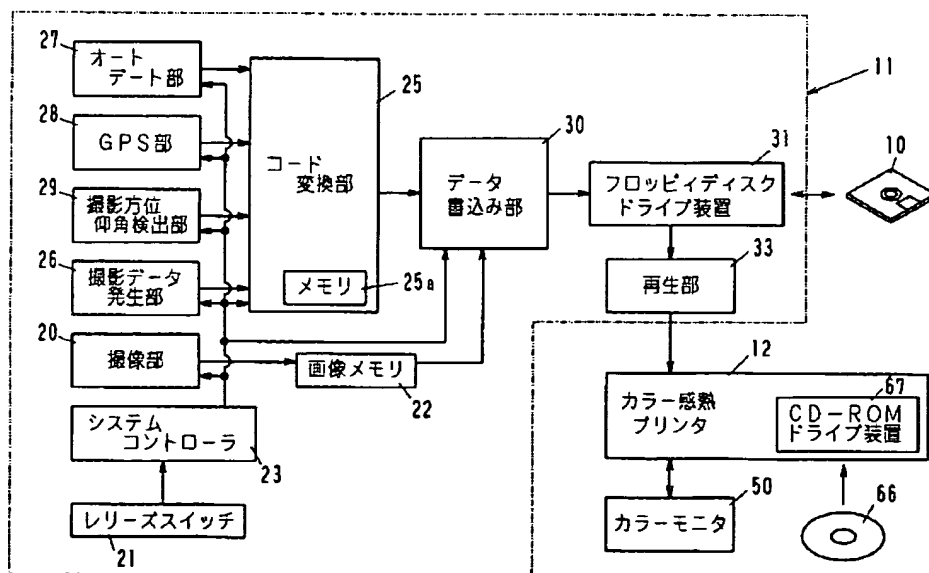
【図9】撮影位置を焼き込むプリンタプロセッサを示す概略図である。

【図10】同プリンタプロセッサで得られたプリント写真の裏面への印字の一例を示す平面図である。

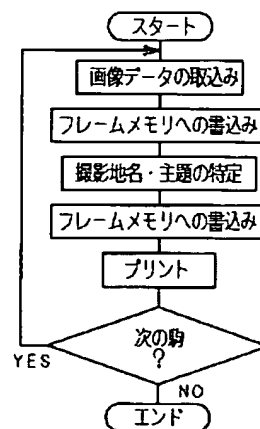
【符号の説明】

- 10 フロッピーディスク
- 11 スチルビデオカメラ
- 12 カラー感熱プリンタ
- 20 撮像部
- 28 GPS部
- 29 撮影方位仰角検出部
- 30 データ書込み部
- 31 フロッピーディスクドライブ装置
- 33 再生部
- 50 カラーモニタ
- 57 カラー感熱記録材料
- 67, 132 CD-ROMドライブ装置
- 68, 133 CD-ROM
- 72 サーマルヘッド
- 75 ハードコピー
- 76 画像
- 77 文字像

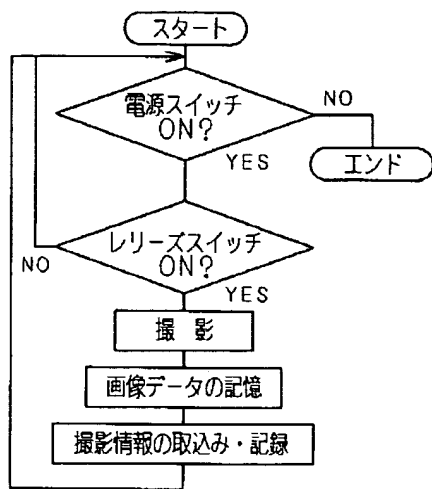
【図1】



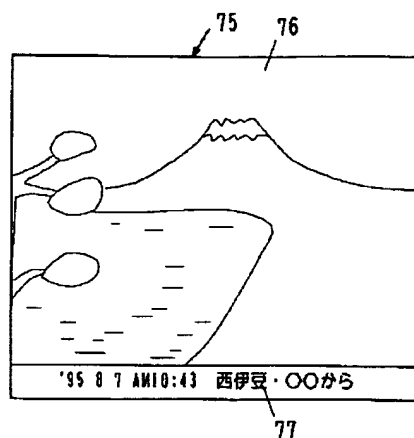
【図5】



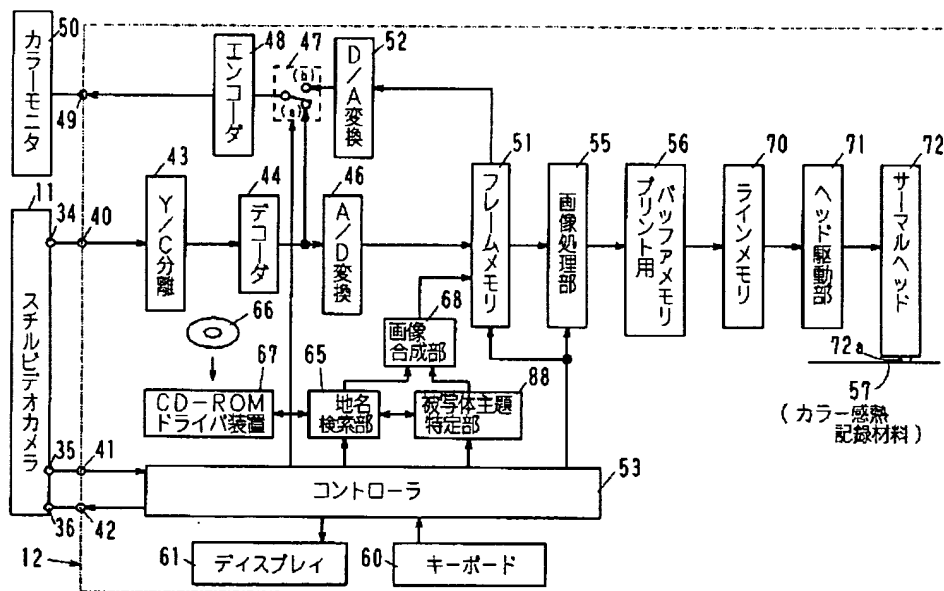
【図2】



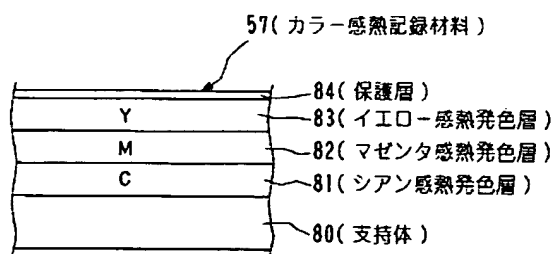
【図4】



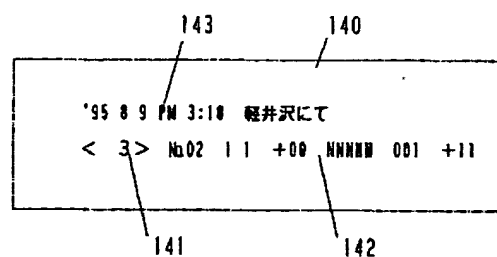
【図3】



【図6】



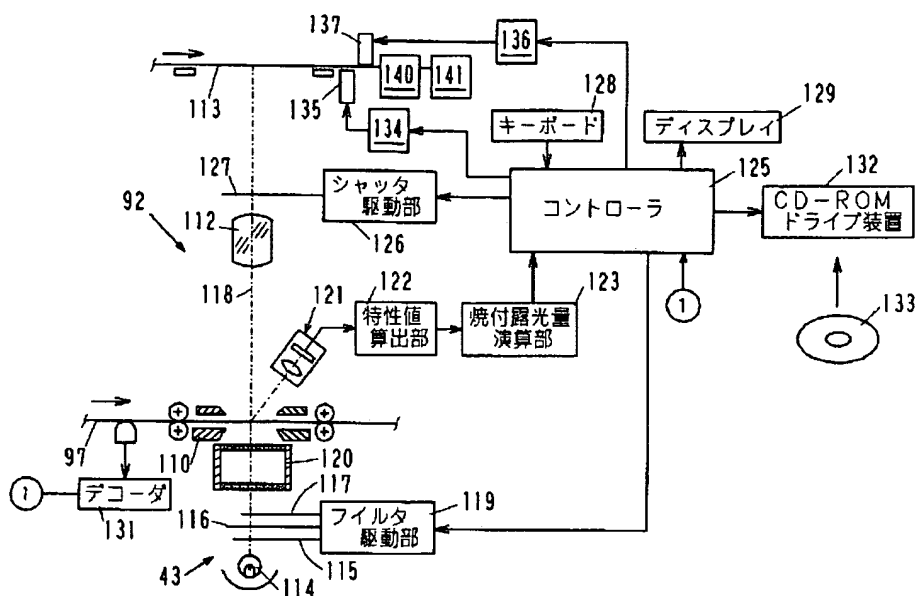
【図10】




```

graph TD
    Start([スタート]) --> Read[緯度・経度情報の読み込み]
    Read --> Search[地名の検索]
    Search --> Spot{主題決定スポット?}
    Spot -- YES --> Lens{撮影レンズの焦点距離  
所定範囲内?}
    Spot -- NO --> NameDecide[地名の決定]
    Lens -- YES --> Direction{撮影方位  
所定範囲内?}
    Lens -- NO --> NameDecide
    Direction -- YES --> TopicDecide[地名・主題の決定]
    Direction -- NO --> NameDecide
    TopicDecide --> Next{次の駒?}
    NameDecide --> Next
    Next -- YES --> Read
    Next -- NO --> End([エンド])
  
```

【図 9】



フロントページの続き

(51) Int. Cl. ⁶

H O 4 N 5/781

識別記号

庁内整理番号

F I

H O 4 N 5/91

技術表示箇所

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CLAIMS

[Claim(s)]

[Claim 1] Photography equipment characterized by having a means to detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal, and the means which writes this camera station information in a record medium.

[Claim 2] The photography equipment characterized by to have the means which writes a means detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal in the photography equipment which recorded the focal distance information on a taking lens at least with photography, a means detect the photography bearing information that photography bearing in the case of photography is pinpointed, and these camera station information and photography bearing information in a record medium.

[Claim 3] The photography equipment characterized by to have the means which writes a means detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal with photography in the photography equipment which recorded the focal distance information on a taking lens at least, a means detect the photography bearing elevation angle information specify photography bearing and the elevation angle of photography in the case, and these camera station information and photography bearing elevation angle information, in a record medium.

[Claim 4] The image reappearance equipment characterized by to have a means determine the photography name of a place from said camera station information, and a means record or display the photography name of a place which searched for with a reappearance image, in the image reappearance equipment which records or displays the image which photoed based on the record medium which recorded the camera station information which pinpoints a camera station uniquely at least with photography on another record medium or a display medium.

[Claim 5] In the image reappearance equipment which records or displays the image photoed based on the record medium which recorded the camera station information and the focal distance information on a taking lens that a camera station is pinpointed uniquely at least, and the bearing information at the time of photography with photography on a record medium or a display medium A means to determine the photography name of a place from said camera station information, and a means to specify the photographic subject theme from the focal distance information on said taking lens, and the bearing information at the time of photography, Image reappearance equipment characterized by having a means to record or display both the photography name of a places and the photographic subject themes which were searched for with a reappearance image. [both / one side or]

[Claim 6] In the image reappearance equipment which records or displays the image photoed based on the record medium which recorded the camera station information and the focal distance information on a taking lens that a camera station is pinpointed uniquely at least, and the bearing elevation angle information at the time of photography with photography on a record medium or a display medium A means to determine the photography name of a place from said camera station information, and a means to specify the photographic subject theme from the focal distance information on said taking lens, and the bearing elevation angle information at the time of photography, Image reappearance equipment characterized by having a means to record or display both the photography name of a places and the photographic subject themes which were searched for with a reappearance image. [both / one side or]

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TECHNICAL FIELD

[Field of the Invention] In case this invention records the camera station information which pinpoints a camera station uniquely, bearing information, bearing elevation angle information at the time of photography, etc. and reproduces an image with photography, it relates to the photography equipment and image reappearance equipment which displayed or recorded the photography name of a place, the photographic subject theme, etc. with the reappearance image.

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PRIOR ART

[Description of the Prior Art] The approach of carrying out a photoprint to a photographic film using the camera and this which recorded photography information, such as light source information, Japan-China synchro information, and photography intention information, in the case of photography etc. is proposed (for example, Japanese-Patent-Application-No. No. 113347 [four to] official report). Moreover, it has the global positioning system (GPS) function to judge the current position based on the signal from a satellite, and in case a photograph is taken, time, the location, and the camera with built-in GPS recorded together are proposed (for example, JP,7-64169,A).

[0003] By using the camera which records the various above-mentioned photography information, the high quality print which various photography information was utilized [print] and fully demonstrated the function of a camera and the engine performance of sensitive material comes to be obtained. Moreover, with the above-mentioned camera with built-in GPS, it is recorded in case the exact photography name of a place is photography, and the print photograph with which the photography name of a place was compounded on the occasion of a photoprint comes to be acquired.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] The photography name of a place beforehand registered based on the lat/long information acquired from the GPS function is searched with the above-mentioned camera with built-in GPS from a geography database, and the corresponding photography name of a place is displayed on the display of a camera. And when these contents are sufficient, information, such as the photography name of a place and photography time, will be recorded by operating a predetermined switch. Therefore, it is necessary to memorize a vast quantity of geography databases which related lat/long information and the photography name of a place corresponding to this with the camera side, and the storage capacity to need will become huge. For this reason, there is a problem that mass storage is needed. Moreover, with the above-mentioned camera with built-in GPS, since the photography name of a place is memorized, there is a problem that it cannot use effectively in assistance of exposure control of camera station data, specification of the photographic subject theme, etc.

[0005] This invention aims at offering the photography equipment and image reappearance equipment which enabled it to pinpoint the photographic subject theme, the location of the sunlight in the case of photography, etc. by displaying a photography location etc. on the photoed screen together moreover based on a GPS function, without using mass storage capacity, and also using combining a photography location, bearing of the exposure axis, the photography information on other, etc.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the photography equipment indicated to claim 1 is equipped with a means to detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal, and the means which writes this camera station information in a record medium. Moreover, photography equipment according to claim 2 is equipped with the means which writes a means to detect the photography bearing information that photography bearing in the case of photography is pinpointed in a thing according to claim 1, and this photography bearing information and the focal distance information on a taking lens in a record medium with camera station information. Moreover, image reappearance equipment according to claim 3 also writes in photography elevation angle information with photography bearing information. Moreover, image reappearance equipment according to claim 4 is equipped with a means to determine the photography name of a place from camera station information, and a means to record or display the photography name of a place searched for with a reappearance image. Moreover, image reappearance equipment according to claim 5 is equipped with a means to determine the photography name of a place from camera station information, a means to specify the photographic subject theme from the focal distance information on a taking lens, and the bearing information at the time of photography, and a means to record or display both the photography name of a place and the photographic subject themes which were searched for with a reappearance image. [both / one side or] Moreover, in case image reappearance equipment according to claim 6 specifies the photographic subject theme, the photography elevation angle information other than bearing information is used for it.

[0007] In the case of photography, with a still video camera, a photographic subject image is picturized by release actuation by the image area sensor, and this image data is written in the record medium of memory, such as for example, an LSI card, or a floppy disk. Moreover, besides the writing of this image data, with other photography time information, the focal distance information on a taking lens, photography bearing information, etc., the camera station information which pinpoints uniquely the camera station in the case of photography by the GPS function, for example, lat/long information, makes it correspond to a photography coma, and it is recorded on a record medium. When reproducing the photoed image, in the case of a still video camera, the lat/long information on a coma for a print, photography time information, the focal distance information on a taking lens, photography bearing elevation angle information, etc. are read first. And the photography name of a place is specified based on lat/long information. Next, "Mt. Fuji", the "North Alps", etc. are pinpointed, for example as the theme of scenery from photography bearing elevation angle information and the focal distance information on a taking lens. These photography name of a place, the photographic subject theme, etc. are displayed on a display with image data. And the photoed color picture is printed for example, on a color thermal recording ingredient by entering the photography name of a place using video printers, such as a color thermal printer, if needed. In this case, the photography address specified based on lat/long information besides the name of a place may be recorded. Moreover, lat/long information etc. may be recorded with a 8mm video camera. The specification becomes easy, when a photography person performs edit and production of hard copy and it specifies the photographic subject theme especially from the camera station information by the GPS function, and photography bearing information in the case of a still video camera or a 8mm video camera.

[0008]

[Embodiment of the Invention] Drawing 1 is the functional block diagram showing the image reappearance system which consists of a color thermal printer 12 which prints an image with the photography name of a place using the still video camera 11 which recorded various photography information with image data, and the data picturized with this still video camera 11 using a floppy disk 10. As everyone knows, the photography section 20 of a still video camera 11 consists of image pick-up optical system and a color image area sensor, by actuation of the release switch 21, picturizes a photographic subject and memorizes this to an image memory 22. Moreover, a focus is performed by the automatic focus device on the occasion of photography.

[0009] Sequence control of the image pick-up section 20 and the image memory 22 is carried out by the system controller 23. The system controller 23 records various photography data on the magnetic-recording layer of a floppy disk 10 with image pick-up data while it consists of well-known microcomputers and picturizes by carrying out sequence control of each part by actuation of the release switch 21. The flow chart of the procedure in a system controller 23 is shown in drawing 2.

[0010] The photography data generating section 26, the auto date section 27, the GPS section 28, and the photography bearing elevation angle detecting element 29 are connected to the code-conversion section 25, and various photography information is inputted into it by these. The photography data generating section 26 generates light source kind information, stroboscope luminescence information, and the focal distance information on a taking

date section 27 sends photography time information to the code-conversion section 25.

[0011] The GPS section 28 sends the lat/long information as camera station information to the code-conversion section 25. The GPS section 28 numeric-data-izes the current position as a numeric value on lat/long as everyone knows based on the signal from at least three satellites. This GPS section 28 is fundamentally [as what is adopted as the navigation system for mount] the same. When the navigation system using this GPS spread in recent years, integration of a circuit is progressing and the GPS section 28 can be carried in a camera on a scale of a very small circuit. And it is suitable for the accuracy of measurement to also have about 25m distinction capacity at all the points on the earth, and pinpoint a camera station also at this point.

[0012] The photography bearing elevation angle detecting element 29 is constituted by the well-known gyroscope device. This gyroscope device detects the sense (bearing) and elevation angle of a camera, and sends this to the code-conversion section as photography bearing elevation angle information in the case of photography.

[0013] Moreover, the number of photography pieces is sent to the code-conversion section 25 from a system controller 23. The code-conversion section 25 encodes various photography information for every photography piece by the predetermined code creation criteria memorized by memory 25a to build in, and sends this to the data write-in section 30. The data write-in section 30 sends the image pick-up data of each piece, and the coded data of photography information to floppy disk drive equipment 31. Floppy disk drive equipment 31 drives the magnetic-recording head to build in, and carries out magnetic recording of image pick-up data and the coded data of photography information to a floppy disk 10 in a predetermined format. In addition, when the photography information on each piece is memorized to memory 25a and all image pick-ups were completed, or when there is an input of a photography information write-in command instead of recording the coded data of photography information whenever it recorded the image pick-up data of each piece, you may make it write the coded data of photography information in a floppy disk 10.

[0014] Moreover, the playback section 33 is formed in the still video camera 11. The playback section 33 reproduces the image pick-up data written in a floppy disk 10, and the coded data of photography information, and as shown in drawing 3, it outputs these to the color thermal printer 12, a personal computer, etc. through the external image output terminal 34, the external control output terminal 35, and the external photography information output terminal 36.

[0015] Next, how to create hard copy with the color thermal printer 12 is explained using the above-mentioned still video camera 11. As shown in drawing 3, the external image input terminal 40 is formed in the color thermal printer 12, and this external image input terminal 40 and the external image output terminal 34 of a still video camera 11 are connected to it. Moreover, a control signal and photography information are inputted from a still video camera 11 through the output terminals 35 and 36 of a still video camera 11, and the input terminals 41 and 42 of the color thermal printer 12.

[0016] The NTSC signal sent out from the external image output terminal 34 is incorporated in the Y/C separation circuit 43 of the color thermal printer 12. The Y/C separation circuit 43 divides an NTSC signal into a luminance signal (Y) and a chrominance signal (C), and sends it to a decoder 44. A decoder 44 changes a luminance signal (Y) and a chrominance signal (C) into red (R), green (G), and a blue (B) three-primary-colors signal, and sends them to A/D converter 46 and a selector 47.

[0017] A selector 47 is usually set to a terminal (a) side by the playback mode, and is set to a terminal (b) side by the freeze mode. If a selector 47 is set to a terminal (a) side, image data will be sent out to the external image output terminal 49 through an encoder 48, and the still video image under playback to the color monitor 50 connected to this will be displayed. In a freeze mode, after the chrominance signal of each color is quantized with A/D converter 46, for example, being changed into a digital signal with 64 gradation, it is written in a frame memory 51. And this image data is sent to a color monitor 50 through the selector 47 set to the D/A-converter 52 and terminal (b) side. Said frame memory 51 consists of the three memory sections which memorize one image data of three colors at a time independently of each.

[0018] A controller 53 reads the image data of one classification by color from a frame memory 51 one by one among three colors at the time of the usual print, and sends this to the image-processing section 55. The image-processing section 55 performs each processing of color correction, concentration amendment, noise rejection, profile emphasis, etc., and writes the image data after this processing in the buffer memory 56 for a print.

[0019] In the image-processing section 55, hue amendment is performed using well-known matrix operation expression, and also color conversion to cyanogen (C), a Magenta (M), and yellow (Y) from R, G, and B is performed. The difference between the spectral characteristic of the color thermal recording ingredient 57 and the spectral sensitivity of a still video camera 11 is amended by this hue amendment. Moreover, in the image-processing section 55, gradation amendment of a gamma correction, contrast amendment, etc. is performed, and thereby, while the stimulus value of the photographic subject of an image pick-up system is changed into a concentration signal, the proper gradient according to the color thermal recording ingredient 57 is held. Moreover, the image-processing section 55 performs operations, such as the weighted mean for noise rejection, mean value filtering which is the noise rejection which does not obscure a boundary as everyone knows using a line type filtering circuit or a logic filtering circuit. Furthermore, based on well-known profile emphasis operation expression, the image data of the target pixel and the pixel in this perimeter also performs profile emphasis processing.

[0020] A controller 53 consists of a well-known microcomputer, and the keyboard 60 and the display 61 are connected. Thereby, a setup and input in various modes can be performed now.

[0021] The photography information from a still video camera 11 is sent to a controller 53 through terminals 35 and 41. A controller 53 sends photography time information, lat/long information, and photography bearing elevation angle information to the name of a place retrieval section 65 among photography information. The name of a place retrieval section 65 associates a camera station from lat/long information. Dissipation of this camera station is

performed using a related ***** positional information database in lat/long information and the name of a place. CD-ROM66 is memorized and provided with a positional information database. For this reason, CD-ROM drive equipment 67 is connected to the name of a place retrieval section 65. And the name of a place to which a point to this point uniquely pinpointed using lat/long information belongs is searched. The thing of lat/long information and the name of a place for which set to relate, and the address on administration is used, and also a prominent sightseeing spot, the building of a shrine Buddhist temple and others, etc. are searched from lat/long information (for example, "Karuzawa", "Tokyo Tower", etc.) is desirable. The searched name of a place data are sent to the image composition section 68 with the photography time information from a controller 53.

[0022] The image composition section 68 carries out bit map expansion of the alphabetic character image showing the name of a place and photography time, and writes this in the alphabetic data write-in area of a frame memory 50. Thereby, image composition of the image from a still video camera 11 and the alphabetic characters, such as camera station information, is carried out. This synthetic image can be checked by the color monitor 50.

[0023] The image data of one line from the buffer memory 56 for a print is written at a time in the line memory 70. The head mechanical component 71 drives a thermal head 72 based on the image data for one line from this Rhine memory 71. As everyone knows, much heater element 72a is arranged in the shape of Rhine, and a thermal head 72 heats the color thermal recording ingredient 57, and performs sequential record 3 color plane. Drawing 4 R> 4 shows an example of the hard copy 75 produced by doing in this way. The alphabetic character image 77 of photography time and the photography name of a place is recorded on this hard copy 75 with the image 76. Drawing 5 is a flow chart which shows the procedure in the color thermal printer 12.

[0024] As shown in drawing 6, as for the color thermal recording ingredient 57, the cyanogen sensible-heat coloring layer 81, the Magenta sensible-heat coloring layer 82, the yellow sensible-heat coloring layer 83, and the protective layer 84 are ****(ed) one by one on the base material 80. As a base material 80, opaque coat paper or plastic film is used. The cyanogen sensible-heat coloring layer 81 contains an electron-donative color precursor and an electronic receptiveness compound as a principal component, and when heated, it colors them in cyanogen. As a Magenta sensible-heat coloring layer 82, the maximum absorption wavelength contains the diazonium salt compound which is about 365nm, and the coupler which carries out thermal reaction to this and colors to a Magenta. If this Magenta sensible-heat coloring layer 82 irradiates the ultraviolet rays near 365nm after heat record, a non-colored diazonium salt compound will photodissociate and coloring capacity will be lost. The yellow sensible-heat coloring layer 83 contains the diazonium salt compound whose maximum absorption wavelength is about 420nm, and the coupler which carries out thermal reaction to this and colors to yellow. If this yellow sensible-heat coloring layer 83 irradiates the ultraviolet rays near 420nm, optical fixing will be carried out and coloring capacity will be lost. In addition, the ultraviolet ray lamp for optical fixing has omitted illustration.

[0025] In addition, the photography name of a place is specified using the lat/long information on photography data, and also you may make it also specify the photographic subject theme automatically with procedure as shown in drawing 7 using the name of a place retrieval section 65 and the photographic subject theme specification section 88. In this case, the focal distance information on a taking lens and photography bearing elevation angle information other than lat/long information are used as photography data. And the specific area of a geography database is specified and the main photographic subjects which can be desired from this area, and a metaphor register the crest, the lake, etc. with that bearing elevation angle information. First, it is judged from lat/long information whether it is the photography location which can specify the photographic subject theme. In corresponding to a theme decision spot, it progresses to the following step, and it is judged whether the focal distance of a taking lens is in the predetermined range. For example, when the crest which serves as the photographic subject theme northward is registered into the theme decision spot and the focal distance of a taking lens is infinity, it progresses to the following step and it is judged for photography bearing and an elevation angle whether it is predetermined within the limits. And when photography bearing shows north, "the identifier of the crest, for example, "Mt. Fuji", the North Alps", etc. are determined as the photographic subject theme. Moreover, bit map expansion is carried out and the alphabetic character image which may combine with not only the photographic subject theme but a photography day and the photography name of a place, for example, expresses a sentence, such as "overlooking Asama-yama from North Karuzawa on August 20, Heisei 7", is written in a frame memory 51. Moreover, when it does not correspond to above-mentioned within the limits at each step, only the photography name of a place is determined. As photography bearing elevation angle information, north is set to "0", by displaying 360 degrees in order of the east, south, and the west, bearing is determined and the inclination information over the horizontal direction of a camera is further determined as an elevation angle, for example. Thus, since the photographic subject theme is specified using photography bearing and an elevation angle, a specific precision can be raised. In addition, specification of the photographic subject theme may specify only photography bearing information using the focal distance information and photography bearing information on a taking lens, although a specific precision other than photography bearing elevation angle information falls. Moreover, altitude information is recorded at the time of photography, and if altitude information is also collectively used in case the photographic subject theme specifies, a specific precision of the photographic subject theme can be raised further.

[0026] Thus, according to the image pick-up and image reappearance system using a still video camera 11 and a video printer 12, the need of inputting a camera station, photography time, etc. each time, or checking time is lost, and it will become suitable as an object for a report as which a sex is required instance. In this case, said photographic subject theme can be more exactly specified now because a cameraman operates a video printer. Moreover, in a video printer, composition of the alphabetic character which shows photography time and a location is easy compared with a photograph printer etc., and will become more effective.

[0027] Said geography database is making it use combining the database currently specially prepared not only in the address on the general name of a place or administration but in business and extensive use is attained. For

example, the steel tower photograph taken to the maintenance is easily discriminable by using the database which registered the positional information of the high-pressure steel tower which the electric power company has. Furthermore, by using photography bearing elevation angle information, altitude information, etc. for this, it can identify [the steel tower photograph from which direction it is also or], and business, such as a maintenance, becomes easy more.

[0028] Although considered as the system which consists of combination of a still video camera 11 and the color thermal printer 12 in the above-mentioned example, you may carry out to the camera 91 using the photographic-film cartridge 90 equipped with the transparence magnetic-recording layer as shown in drawing 8 , and the photograph printer 92 as shown in drawing 9 . In this case, while the release switch 93 is operated by actuation of a release carbon button as shown in drawing 8 , and exposing a photographic subject image to the sensitive-emulsion side of a photographic film 97 using a taking lens 94, the shutter style 95, and a mechanical component 96, the magnetic-recording head 98 is used for the transparence magnetic-recording layer of a photographic film 97, and magnetic recording of the photography information is carried out. For this reason, a system controller 100 controls the auto date section 101, the GPS section 102, the photography bearing elevation angle detecting element 103, the photography data generating section 104, the code-conversion section 105, and the data write-in section 106, and carries out magnetic recording of photography time information, lat/long information, photography bearing elevation angle information, stroboscope luminescence information, the focal distance information on a taking lens, the photographic subject brightness information, etc. to a transparence magnetic-recording layer as photography information.

[0029] As shown in drawing 9 , by the photograph printer 92, the coma for a print of the photographic film 97 set to the tape carrier package 110 is illuminated as everyone knows by the light source section 111 by which light quality adjustment was carried out, and printing exposure of the image of the coma for a print of this illuminated photographic film 97 is carried out with the printing lens 112 at a color paper 113. The light source section 111 consists of a lamp 114, a filter mechanical component 119 which inserts the 3 color filter 115,116,117 in the printing optical path 118, and carries out light quality adjustment, and a diffusion box 120. Moreover, the scanner 121 is arranged as everyone knows in the location which faces a coma for a print, and 3 *****s of this scanner 121 measure the strength of the light in each point of a coma for a print. This photometry value is sent to the characteristic value calculation section 122. The characteristic value calculation section 122 extracts various characteristic values, and also carries out the scene classification of the coma for a print as everyone knows, and computes the amount of exposure amendments based on this scene classification result. The light exposure operation part 123 by which a characteristic value and the amount of exposure amendments are sent to the light exposure operation part 123 computes the printing light exposure which used well-known light exposure operation expression, and sends this to a controller 125. A controller 125 computes the insertion point to the printing optical path 118 of color filters 115-117 based on this printing light exposure, and sends this to the filter mechanical component 119. The filter mechanical component 119 inserts each color filters 115-117 in a filter insertion point, and adjusts the light quality of printing light. After carrying out light quality accommodation, the shutter mechanical component 126 opens a shutter 127 fixed time, and carries out printing exposure of the image of a coma for a print at a color paper 113.

[0030] The magnetic read head 130 is formed in the tape carrier package 110, and the photography information recorded on the transparence magnetic-recording layer is read. A decoder 131 changes photography information into an available data format by the photograph printer 92, and sends this to a controller 125. CD-ROM drive equipment 132 is set to the controller 125, the geography database memorized by CD-ROM133 is searched for it, and the photographic subject theme is specified as it a camera station and if needed. Pinpointing of this camera station etc. is performed by operating the keyboard 128 and display 129 which were connected to the controller 125, and the camera station and photography time which were specified are sent to the alphabetic character baking controller 134. By synchronizing the alphabetic character glow lump head 135 with delivery of a color paper 113, and driving it, the alphabetic character baking controller 134 carries out Rhine exposure of the alphabetic characters, such as a camera station, at a color paper 113, and burns an alphabetic character. Moreover, exposure amendment data, a coma number, etc. are sent to the flesh-side printing controller 136. The flesh-side printing controller 136 drives the flesh-side print head 137, and prints a coma number and exposure amendment data at the rear face of a color paper 113 as everyone knows. After a constant-rate reservoir is carried out with the paper reservoir 140, by the paper processor 141, the development of the color paper 113 with which printing exposure of the image of a photographic film 97 is carried out, and the photography name of a place etc. was burned is carried out, and it is cut for every coma. The print photograph with which a camera station and photography time were burned like the hard copy which this shows to drawing 4 is produced.

[0031] In addition, a camera station is burned, and also using the flesh-side print head 137, as shown in drawing 10 , the alphabetic characters 143, such as a camera station, and the photography theme, photography time, may be printed with the coma number 141 and the exposure amendment data 142 at the rear face 140 of a print photograph. Moreover, in the above-mentioned example, although photography information was recorded on the transparence magnetic-recording layer of a photographic film 97, it may replace with this and photography information may be recorded on the LSI memory and the LSI card which were prepared with a cartridge 90, one, or another object. Moreover, lat/long information may be bar-code-ized and may be optically recorded on a corresponding piece.

[0032] Moreover, although the color thermal printer 12 was used as a video printer, the video printer of various recording methods, such as a recording method of the thermofusion mold using an ink ribbon or a heat sublimation mold, and an ink jet method, a laser-beam method, can be used. Moreover, you may make it record image data and photography information on an LSI card etc. electronically in a still video camera 11 instead of carrying out magnetic

recording to a floppy disk 10.

[0033] Furthermore, you may carry out to the video camera which memorizes the dynamic image and voice other than a still video camera which record a static image. In this case, it is good to add retrieval functions, such as the name of a place, to a videocassette recorder, to carry out image composition of the photography name of a place, the photography time, etc., and to display on a monitor. Moreover, it synthesizes voice from the photography name of a place and time other than image composition of an alphabetic character, and you may make it record this on a corresponding image. Moreover, what was constituted so that digital image data might be outputted is sufficient as a still video camera, and image data is recorded in this case using a well-known picture compression method.

Moreover, what was included in the video printer is used, and also pinpointing of a camera station may be performed using a personal computer etc.

[0034] moreover — backlight photography of as opposed to [in the system using a photographic film, pinpoint the location of the sun at the time of photography from photography time information, camera station information, and photography bearing information, and] the sunlight from this solar positional information and photography brightness information ***** — etc. — it may be made to perform concentration of the image judged and photoed, and color balance amendment. Moreover, in the above-mentioned example, as camera station information, although lat/long information was used, the polar-coordinate data of a three dimension etc. may be used that what is necessary is just what can pinpoint a photography location uniquely.

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, since the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal is searched for and this camera station information was written in the record medium, based on camera station information, the name of a place etc. cannot be specified by the photography equipment side, and the configuration by the side of a camera can be simplified. And the camera station information which can pinpoint a camera station uniquely is written in the record medium, and data processing can be performed now by the image reappearance equipment side based on camera station information. Therefore, it is not necessary to suppress the amount of information of a geography database few, and specification of the accurate photography name of a place is attained.

[0036] Moreover, specification of the photographic subject theme etc. is attained other than the specification of the mere photography name of a place as photography information by using the photography bearing information and the focal distance information on a taking lens other than camera station information. Moreover, by using the geography database which inputted location data, such as a specific building, specification of the copied building, its photography sense, etc. can be easily known from camera station information and photography bearing information, and in case it is photography, it is not necessary to fill in a memorandum etc. and becomes convenient. Furthermore, a specific precision of the photographic subject theme can be raised now by adding the photography elevation angle information other than photography bearing information.

[Translation done.]

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2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] In case this invention records the camera station information which pinpoints a camera station uniquely, bearing information, bearing elevation angle information at the time of photography, etc. and reproduces an image with photography, it relates to the photography equipment and image reappearance equipment which displayed or recorded the photography name of a place, the photographic subject theme, etc. with the reappearance image.

[0002]

[Description of the Prior Art] The approach of carrying out a photoprint to a photographic film using the camera and this which recorded photography information, such as light source information, Japan-China synchro information, and photography intention information, in the case of photography etc. is proposed (for example, Japanese-Patent-Application-No. No. 113347 [four to] official report). Moreover, it has the global positioning system (GPS) function to judge the current position based on the signal from a satellite, and in case a photograph is taken, time, the location, and the camera with built-in GPS recorded together are proposed (for example, JP,7-64169,A).

[0003] By using the camera which records the various above-mentioned photography information, the high quality print which various photography information was utilized [print] and fully demonstrated the function of a camera and the engine performance of sensitive material comes to be obtained. Moreover, with the above-mentioned camera with built-in GPS, it is recorded in case the exact photography name of a place is photography, and the print photograph with which the photography name of a place was compounded on the occasion of a photoprint comes to be acquired.

[0004]

[Problem(s) to be Solved by the Invention] The photography name of a place beforehand registered based on the lat/long information acquired from the GPS function is searched with the above-mentioned camera with built-in GPS from a geography database, and the corresponding photography name of a place is displayed on the display of a camera. And when these contents are sufficient, information, such as the photography name of a place and photography time, will be recorded by operating a predetermined switch. Therefore, it is necessary to memorize a vast quantity of geography databases which related lat/long information and the photography name of a place corresponding to this with the camera side, and the storage capacity to need will become huge. For this reason, there is a problem that mass storage is needed. Moreover, with the above-mentioned camera with built-in GPS, since the photography name of a place is memorized, there is a problem that it cannot use effective in assistance of exposure control of camera station data, specification of the photographic subject theme, etc.

[0005] This invention aims at offering the photography equipment and image reappearance equipment which enabled it to pinpoint the photographic subject theme, the location of the sunlight in the case of photography, etc. by displaying a photography location etc. on the photoed screen together moreover based on a GPS function, without using mass storage capacity, and also using combining a photography location, bearing of the exposure axis, the photography information on other, etc.

[0006]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the photography equipment indicated to claim 1 is equipped with a means to detect the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal, and the means which writes this camera station information in a record medium. Moreover, photography equipment according to claim 2 is equipped with the means which writes a means to detect the photography bearing information that photography bearing in the case of photography is pinpointed in a thing according to claim 1, and this photography bearing information and the focal distance information on a taking lens in a record medium with camera station information. Moreover, image reappearance equipment according to claim 3 also writes in photography elevation angle information with photography bearing information. Moreover, image reappearance equipment according to claim 4 is equipped with a means to determine the photography name of a place from camera station information, and a means to record or display the photography name of a place searched for with a reappearance image. Moreover, image reappearance equipment according to claim 5 is equipped with a means to determine the photography name of a place from camera station information, a means to specify the photographic subject theme from the focal distance information on a taking lens, and the bearing information at the time of photography, and a means to record or display both the photography name of a places and the photographic subject themes which were searched for with a reappearance image. [both / one side or] Moreover, in case image reappearance equipment according to claim 6 specifies the photographic subject theme, the photography elevation angle information other than bearing information is used for

[0007] In the case of photography, with a still video camera, a photographic subject image is picturized by release actuation by the image area sensor, and this image data is written in the record medium of memory, such as for example, an LSI card, or a floppy disk. Moreover, besides the writing of this image data, with other photography time information, the focal distance information on a taking lens, photography bearing information, etc., the camera station information which pinpoints uniquely the camera station in the case of photography by the GPS function, for example, lat/long information, makes it correspond to a photography coma, and it is recorded on a record medium. When reproducing the photoed image, in the case of a still video camera, the lat/long information on a coma for a print, photography time information, the focal distance information on a taking lens, photography bearing elevation angle information, etc. are read first. And the photography name of a place is specified based on lat/long information. Next, "Mt. Fuji", the "North Alps", etc. are pinpointed, for example as the theme of scenery from photography bearing elevation angle information and the focal distance information on a taking lens. These photography name of a place, the photographic subject theme, etc. are displayed on a display with image data. And the photoed color picture is printed for example, on a color thermal recording ingredient by entering the photography name of a place using video printers, such as a color thermal printer, if needed. In this case, the photography address specified based on lat/long information besides the name of a place may be recorded. Moreover, lat/long information etc. may be recorded with a 8mm video camera. The specification becomes easy, when a photography person performs edit and production of hard copy and it specifies the photographic subject theme especially from the camera station information by the GPS function, and photography bearing information in the case of a still video camera or a 8mm video camera.

[0008]

[Embodiment of the Invention] Drawing 1 is the functional block diagram showing the image reappearance system which consists of a color thermal printer 12 which prints an image with the photography name of a place using the still video camera 11 which recorded various photography information with image data, and the data picturized with this still video camera 11 using a floppy disk 10. As everyone knows, the photography section 20 of a still video camera 11 consists of image pick-up optical system and a color image area sensor, by actuation of the release switch 21, picturizes a photographic subject and memorizes this to an image memory 22. Moreover, a focus is performed by the automatic focus device on the occasion of photography.

[0009] Sequence control of the image pick-up section 20 and the image memory 22 is carried out by the system controller 23. The system controller 23 records various photography data on the magnetic-recording layer of a floppy disk 10 with image pick-up data while it consists of well-known microcomputers and picturizes by carrying out sequence control of each part by actuation of the release switch 21. The flow chart of the procedure in a system controller 23 is shown in drawing 2.

[0010] The photography data generating section 26, the auto date section 27, the GPS section 28, and the photography bearing elevation angle detecting element 29 are connected to the code-conversion section 25, and various photography information is inputted into it by these. The photography data generating section 26 generates light source kind information, stroboscope luminescence information, and the focal distance information on a taking lens with the signal acquired from the various sensors which are not illustrated or a system controller 23. The auto date section 27 sends photography time information to the code-conversion section 25.

[0011] The GPS section 28 sends the lat/long information as camera station information to the code-conversion section 25. The GPS section 28 numeric-data-izes the current position as a numeric value on lat/long as everyone knows based on the signal from at least three satellites. This GPS section 28 is fundamentally [as what is adopted as the navigation system for mount] the same. When the navigation system using this GPS spread in recent years, integration of a circuit is progressing and the GPS section 28 can be carried in a camera on a scale of a very small circuit. And it is suitable for the accuracy of measurement to also have about 25m distinction capacity at all the points on the earth, and pinpoint a camera station also at this point.

[0012] The photography bearing elevation angle detecting element 29 is constituted by the well-known gyroscope device. This gyroscope device detects the sense (bearing) and elevation angle of a camera, and sends this to the code-conversion section as photography bearing elevation angle information in the case of photography.

[0013] Moreover, the number of photography pieces is sent to the code-conversion section 25 from a system controller 23. The code-conversion section 25 encodes various photography information for every photography piece by the predetermined code creation criteria memorized by memory 25a to build in, and sends this to the data write-in section 30. The data write-in section 30 sends the image pick-up data of each piece, and the coded data of photography information to floppy disk drive equipment 31. Floppy disk drive equipment 31 drives the magnetic-recording head to build in, and carries out magnetic recording of image pick-up data and the coded data of photography information to a floppy disk 10 in a predetermined format. In addition, when the photography information on each piece is memorized to memory 25a and all image pick-ups were completed, or when there is an input of a photography information write-in command instead of recording the coded data of photography information whenever it recorded the image pick-up data of each piece, you may make it write the coded data of photography information in a floppy disk 10.

[0014] Moreover, the playback section 33 is formed in the still video camera 11. The playback section 33 reproduces the image pick-up data written in a floppy disk 10, and the coded data of photography information, and as shown in drawing 3, it outputs these to the color thermal printer 12, a personal computer, etc. through the external image output terminal 34, the external control output terminal 35, and the external photography information output terminal 36.

[0015] Next, how to create hard copy with the color thermal printer 12 is explained using the above-mentioned still video camera 11. As shown in drawing 3, the external image input terminal 40 is formed in the color thermal printer 12, and this external image input terminal 40 and the external image output terminal 34 of a still video camera 11 are

connected to it. Moreover, a control signal and photography information are inputted from a still video camera 11 through the output terminals 35 and 36 of a still video camera 11, and the input terminals 41 and 42 of the color thermal printer 12.

[0016] The NTSC signal sent out from the external image output terminal 34 is incorporated in the Y/C separation circuit 43 of the color thermal printer 12. The Y/C separation circuit 43 divides an NTSC signal into a luminance signal (Y) and a chrominance signal (C), and sends it to a decoder 44. A decoder 44 changes a luminance signal (Y) and a chrominance signal (C) into red (R), green (G), and a blue (B) three-primary-colors signal, and sends them to A/D converter 46 and a selector 47.

[0017] A selector 47 is usually set to a terminal (a) side by the playback mode, and is set to a terminal (b) side by the freeze mode. If a selector 47 is set to a terminal (a) side, image data will be sent out to the external image output terminal 49 through an encoder 48, and the still video image under playback to the color monitor 50 connected to this will be displayed. In a freeze mode, after the chrominance signal of each color is quantized with A/D converter 46, for example, being changed into a digital signal with 64 gradation, it is written in a frame memory 51. And this image data is sent to a color monitor 50 through the selector 47 set to the D/A-converter 52 and terminal (b) side. Said frame memory 51 consists of the three memory sections which memorize one image data of three colors at a time independently of each.

[0018] A controller 53 reads the image data of one classification by color from a frame memory 51 one by one among three colors at the time of the usual print, and sends this to the image-processing section 55. The image-processing section 55 performs each processing of color correction, concentration amendment, noise rejection, profile emphasis, etc., and writes the image data after this processing in the buffer memory 56 for a print.

[0019] In the image-processing section 55, hue amendment is performed using well-known matrix operation expression, and also color conversion to cyanogen (C), a Magenta (M), and yellow (Y) from R, G, and B is performed. The difference between the spectral characteristic of the color thermal recording ingredient 57 and the spectral sensitivity of a still video camera 11 is amended by this hue amendment. Moreover, in the image-processing section 55, gradation amendment of a gamma correction, contrast amendment, etc. is performed, and thereby, while the stimulus value of the photographic subject of an image pick-up system is changed into a concentration signal, the proper gradient according to the color thermal recording ingredient 57 is held. Moreover, the image-processing section 55 performs operations, such as the weighted mean for noise rejection, mean value filtering which is the noise rejection which does not obscure a boundary as everyone knows using a line type filtering circuit or a logic filtering circuit. Furthermore, based on well-known profile emphasis operation expression, the image data of the target pixel and the pixel in this perimeter also performs profile emphasis processing.

[0020] A controller 53 consists of a well-known microcomputer, and the keyboard 60 and the display 61 are connected. Thereby, a setup and input in various modes can be performed now.

[0021] The photography information from a still video camera 11 is sent to a controller 53 through terminals 35 and 41. A controller 53 sends photography time information, lat/long information, and photography bearing elevation angle information to the name of a place retrieval section 65 among photography information. The name of a place retrieval section 65 pinpoints a camera station from lat/long information. Pinpointing of this camera station is performed using a related ***** positional information database in lat/long information and the name of a place. CD-ROM66 is memorized and provided with a positional information database. For this reason, CD-ROM drive equipment 67 is connected to the name of a place retrieval section 65. And the name of a place to which a point to this point uniquely pinpointed using lat/long information belongs is searched. The thing of lat/long information and the name of a place for which set to relate, and the address on administration is used, and also a prominent sightseeing spot, the building of a shrine Buddhist temple and others, etc. are searched from lat/long information (for example, "Karuizawa", "Tokyo Tower", etc.) is desirable. The searched name of a place data are sent to the image composition section 68 with the photography time information from a controller 53.

[0022] The image composition section 68 carries out bit map expansion of the alphabetic character image showing the name of a place and photography time, and writes this in the alphabetic data write-in area of a frame memory 50. Thereby, image composition of the image from a still video camera 11 and the alphabetic characters, such as camera station information, is carried out. This synthetic image can be checked by the color monitor 50.

[0023] The image data of one line from the buffer memory 56 for a print is written at a time in the line memory 70. The head mechanical component 71 drives a thermal head 72 based on the image data for one line from this Rhine memory 71. As everyone knows, much heater element 72a is arranged in the shape of Rhine, and a thermal head 72 heats the color thermal recording ingredient 57, and performs sequential record 3 color plane. Drawing 4 R > 4 shows an example of the hard copy 75 produced by doing in this way. The alphabetic character image 77 of photography time and the photography name of a place is recorded on this hard copy 75 with the image 76. Drawing 5 is a flow chart which shows the procedure in the color thermal printer 12.

[0024] As shown in drawing 6, as for the color thermal recording ingredient 57, the cyanogen sensible-heat coloring layer 81, the Magenta sensible-heat coloring layer 82, the yellow sensible-heat coloring layer 83, and the protective layer 84 are ****(ed) one by one on the base material 80. As a base material 80, opaque coat paper or plastic film is used. The cyanogen sensible-heat coloring layer 81 contains an electron-donative color precursor and an electronic receptiveness compound as a principal component, and when heated, it colors them in cyanogen. As a Magenta sensible-heat coloring layer 82, the maximum absorption wavelength contains the diazonium salt compound which is about 365nm, and the coupler which carries out thermal reaction to this and colors to a Magenta. If this Magenta sensible-heat coloring layer 82 irradiates the ultraviolet rays near 365nm after heat record, a non-colored diazonium salt compound will photodissociate and coloring capacity will be lost. The yellow sensible-heat coloring layer 83 contains the diazonium salt compound whose maximum absorption wavelength is about 420nm, and the coupler

irradiates the ultraviolet rays near 420nm, optical fixing will be carried out and coloring capacity will be lost. In addition, the ultraviolet ray lamp for optical fixing has omitted illustration.

[0025] In addition, the photography name of a place is specified using the lat/long information on photography data, and also you may make it also specify the photographic subject theme automatically with procedure as shown in drawing 7 using the name of a place retrieval section 65 and the photographic subject theme specification section 88. In this case, the focal distance information on a taking lens and photography bearing elevation angle information other than lat/long information are used as photography data. And the specific area of a geography database is specified and the main photographic subjects which can be desired from this area, and a metaphor register the crest, the lake, etc. with that bearing elevation angle information. First, it is judged from lat/long information whether it is the photography location which can specify the photographic subject theme. In corresponding to a theme decision spot, it progresses to the following step, and it is judged whether the focal distance of a taking lens is in the predetermined range. For example, when the crest which serves as the photographic subject theme northward is registered into the theme decision spot and the focal distance of a taking lens is infinity, it progresses to the following step and it is judged for photography bearing and an elevation angle whether it is predetermined within the limits. And when photography bearing shows north, "the identifier of the crest, for example, "Mt. Fuji", the North Alps", etc. are determined as the photographic subject theme. Moreover, bit map expansion is carried out and the alphabetic character image which may combine with not only the photographic subject theme but a photography day and the photography name of a place, for example, expresses a sentence, such as "overlooking Asama-yama from North Karuizawa on August 20, Heisei 7", is written in a frame memory 51. Moreover, when it does not correspond to above-mentioned within the limits at each step, only the photography name of a place is determined. As photography bearing elevation angle information, north is set to "0", by displaying 360 degrees in order of the east, south, and the west, bearing is determined and the inclination information over the horizontal direction of a camera is further determined as an elevation angle, for example. Thus, since the photographic subject theme is specified using photography bearing and an elevation angle, a specific precision can be raised. In addition, specification of the photographic subject theme may specify only photography bearing information using the focal distance information and photography bearing information on a taking lens, although a specific precision other than photography bearing elevation angle information falls. Moreover, altitude information is recorded at the time of photography, and if altitude information is also collectively used in case the photographic subject theme specifies, a specific precision of the photographic subject theme can be raised further.

[0026] Thus, according to the image pick-up and image reappearance system using a still video camera 11 and a video printer 12, the need of inputting a camera station, photography time, etc. each time, or checking them is lost, and it will become suitable as an object for a report as which a sex is required instantly. In this case, said photographic subject theme can be more exactly specified now because a cameraman operates a video printer. Moreover, in a video printer, composition of the alphabetic character which shows photography time and a location is easy compared with a photograph printer etc., and will become more effective.

[0027] Said geography database is making it use combining the database currently specially prepared not only in the address on the general name of a place or administration but in business, and extensive use is attained. For example, the steel tower photograph taken to the maintenance is easily discriminable by using the database which registered the positional information of the high-pressure steel tower which the electric power company has. Furthermore, by using photography bearing elevation angle information, altitude information, etc. for this, it can identify [the steel tower photograph from which direction it is also or], and business, such as a maintenance, becomes easy more.

[0028] Although considered as the system which consists of combination of a still video camera 11 and the color thermal printer 12 in the above-mentioned example, you may carry out to the camera 91 using the photographic-film cartridge 90 equipped with the transparence magnetic-recording layer as shown in drawing 8, and the photograph printer 92 as shown in drawing 9. In this case, while the release switch 93 is operated by actuation of a release carbon button as shown in drawing 8, and exposing a photographic subject image to the sensitive-emulsion side of a photographic film 97 using a taking lens 94, the shutter style 95, and a mechanical component 96, the magnetic-recording head 98 is used for the transparence magnetic-recording layer of a photographic film 97, and magnetic recording of the photography information is carried out. For this reason, a system controller 100 controls the auto date section 101, the GPS section 102, the photography bearing elevation angle detecting element 103, the photography data generating section 104, the code-conversion section 105, and the data write-in section 106, and carries out magnetic recording of photography time information, lat/long information, photography bearing elevation angle information, stroboscope luminescence information, the focal distance information on a taking lens, the photographic subject brightness information, etc. to a transparence magnetic-recording layer as photography information.

[0029] As shown in drawing 9, by the photograph printer 92, the coma for a print of the photographic film 97 set to the tape carrier package 110 is illuminated as everyone knows by the light source section 111 by which light quality adjustment was carried out, and printing exposure of the image of the coma for a print of this illuminated photographic film 97 is carried out with the printing lens 112 at a color paper 113. The light source section 111 consists of a lamp 114, a filter mechanical component 119 which inserts the 3 color filter 115,116,117 in the printing optical path 118, and carries out light quality adjustment, and a diffusion box 120. Moreover, the scanner 121 is arranged as everyone knows in the location which faces a coma for a print, and 3 *****s of this scanner 121 measure the strength of the light in each point of a coma for a print. This photometry value is sent to the characteristic value calculation section 122. The characteristic value calculation section 122 extracts various characteristic values, and also carries out the scene classification of the coma for a print as everyone knows, and computes the amount of exposure adjustments based on this scene classification results. The light exposure

operation part 123 by which a characteristic value and the amount of exposure amendments are sent to the light exposure operation part 123 computes the printing light exposure which used well-known light exposure operation expression, and sends this to a controller 125. A controller 125 computes the insertion point to the printing optical path 118 of color filters 115-117 based on this printing light exposure, and sends this to the filter mechanical component 119. The filter mechanical component 119 inserts each color filters 115-117 in a filter insertion point, and adjusts the light quality of printing light. After carrying out light quality accommodation, the shutter mechanical component 126 opens a shutter 127 fixed time, and carries out printing exposure of the image of a coma for a print at a color paper 113.

[0030] The magnetic read head 130 is formed in the tape carrier package 110, and the photography information recorded on the transparence magnetic-recording layer is read. A decoder 131 changes photography information into an available data format by the photograph printer 92, and sends this to a controller 125. CD-ROM drive equipment 132 is set to the controller 125, the geography database memorized by CD-ROM 133 is searched for it, and the photographic subject theme is specified as it a camera station and if needed. Pinpointing of this camera station etc. is performed by operating the keyboard 128 and display 129 which were connected to the controller 125, and the camera station and photography time which were specified are sent to the alphabetic character baking controller 134. By synchronizing the alphabetic character glow lump head 135 with delivery of a color paper 113, and driving it, the alphabetic character baking controller 134 carries out Rhine exposure of the alphabetic characters, such as a camera station, at a color paper 113, and burns an alphabetic character. Moreover, exposure amendment data, a coma number, etc. are sent to the flesh-side printing controller 136. The flesh-side printing controller 136 drives the flesh-side print head 137, and prints a coma number and exposure amendment data at the rear face of a color paper 113 as everyone knows. After a constant-rate reservoir is carried out with the paper reservoir 140, by the paper processor 141, the development of the color paper 113 with which printing exposure of the image of a photographic film 97 is carried out, and the photography name of a place etc. was burned is carried out, and it is cut for every coma. The print photograph with which a camera station and photography time were burned like the hard copy which this shows to drawing 4 is produced.

[0031] In addition, a camera station is burned, and also using the flesh-side print head 137, as shown in drawing 10, the alphabetic characters 143, such as a camera station, and the photography theme, photography time, may be printed with the coma number 141 and the exposure amendment data 142 at the rear face 140 of a print photograph. Moreover, in the above-mentioned example, although photography information was recorded on the transparence magnetic-recording layer of a photographic film 97, it may replace with this and photography information may be recorded on the LSI memory and the LSI card which were prepared with a cartridge 90, one, or another object. Moreover, lat/long information may be bar-code-ized and may be optically recorded on a corresponding piece.

[0032] Moreover, although the color thermal printer 12 was used as a video printer, the video printer of various recording methods, such as a recording method of the thermofusion mold using an ink ribbon or a heat sublimation mold, and an ink jet method, a laser-beam method, can be used. Moreover, you may make it record image data and photography information on an LSI card etc. electronically in a still video camera 11 instead of carrying out magnetic recording to a floppy disk 10.

[0033] Furthermore, you may carry out to the video camera which memorizes the dynamic image and voice other than a still video camera which record a static image. In this case, it is good to add retrieval functions, such as the name of a place, to a videocassette recorder, to carry out image composition of the photography name of a place, the photography time, etc., and to display on a monitor. Moreover, it synthesizes voice from the photography name of a place and time other than image composition of an alphabetic character, and you may make it record this on a corresponding image. Moreover, what was constituted so that digital image data might be outputted is sufficient as a still video camera, and image data is recorded in this case using a well-known picture compression method. Moreover, what was included in the video printer is used, and also pinpointing of a camera station may be performed using a personal computer etc.

[0034] moreover — backlight photography of as opposed to [in the system using a photographic film, pinpoint the location of the sun at the time of photography from photography time information, camera station information, and photography bearing information, and] the sunlight from this solar positional information and photography brightness information ***** — etc. — it may be made to perform concentration of the image judged and photoed, and color balance amendment. Moreover, in the above-mentioned example, as camera station information, although lat/long information was used, the polar-coordinate data of a three dimension etc. may be used that what is necessary is just what can pinpoint a photography location uniquely.

[0035]

[Effect of the Invention] According to this invention, since the camera station information which pinpoints the camera station in the case of photography uniquely with a GPS signal is searched for and this camera station information was written in the record medium, based on camera station information, the name of a place etc. cannot be specified by the photography equipment side, and the configuration by the side of a camera can be simplified. And the camera station information which can pinpoint a camera station uniquely is written in the record medium, and data processing can be performed now by the image reappearance equipment side based on camera station information. Therefore, it is not necessary to suppress the amount of information of a geography database few, and specification of the accurate photography name of a place is attained.

[0036] Moreover, specification of the photographic subject theme etc. is attained other than the specification of the mere photography name of a place as photography information by using the photography bearing information and the focal distance information on a taking lens other than camera station information. Moreover, by using the geography database which inserted location data such as a specific building specification of the actual building etc.

photography sense, etc. can be easily known from camera station information and photography bearing information, and in case it is photography, it is not necessary to fill in a memorandum etc. and becomes convenient. Furthermore, a specific precision of the photographic subject theme can be raised now by adding the photography elevation angle information other than photography bearing information.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

- [Drawing 1] It is the schematic diagram showing the still video camera which carried out this invention.
- [Drawing 2] It is the flow chart which shows the procedure in this still video camera.
- [Drawing 3] It is the functional block diagram showing the color thermal printer which carried out this invention.
- [Drawing 4] It is the front view showing an example of hard copy.
- [Drawing 5] It is the flow chart which shows the procedure of a color thermal printer.
- [Drawing 6] It is the schematic diagram showing the layer structure of a color thermal recording ingredient.
- [Drawing 7] It is the flow chart which shows the procedure which specifies the photographic subject theme.
- [Drawing 8] It is the schematic diagram showing the camera which records lat/long information.
- [Drawing 9] It is the schematic diagram showing the printer processor which burns a camera station.
- [Drawing 10] It is the top view showing an example of printing to the rear face of the print photograph acquired by this printer processor.

[Description of Notations]

- 10 Floppy Disk
- 11 Still Video Camera
- 12 Color Thermal Printer
- 20 Image Pick-up Section
- 28 The GPS Section
- 29 Photography Bearing Elevation Angle Detecting Element
- 30 Data Write-in Section
- 31 Floppy Disk Drive Equipment
- 33 Playback Section
- 50 Color Monitor
- 57 Color Thermal Recording Ingredient
- 67,132 CD-ROM drive equipment
- 68,133 CD-ROM
- 72 Thermal Head
- 75 Hard Copy
- 76 Image
- 77 Alphabetic Character Image

[Translation done.]

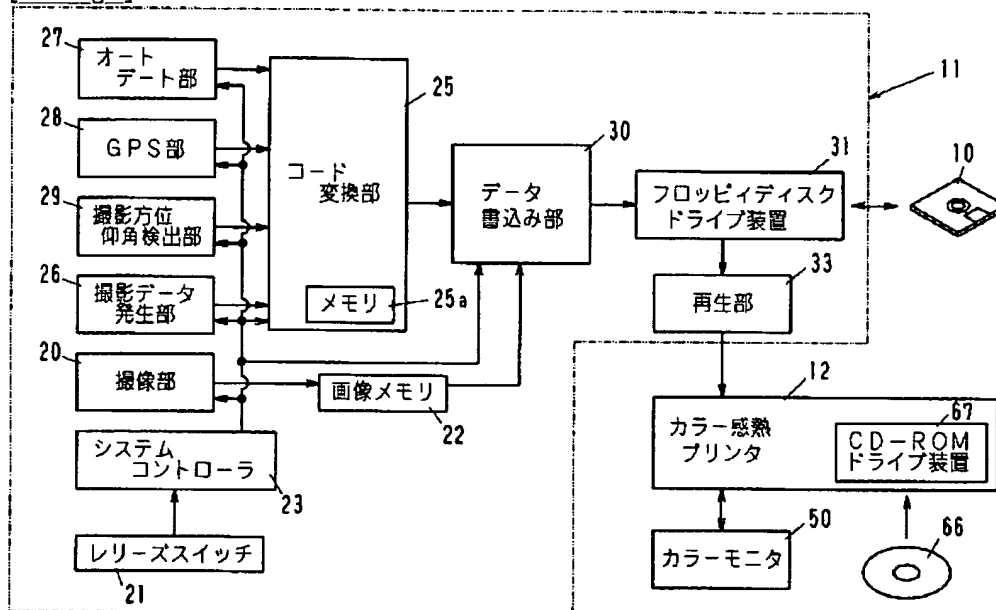
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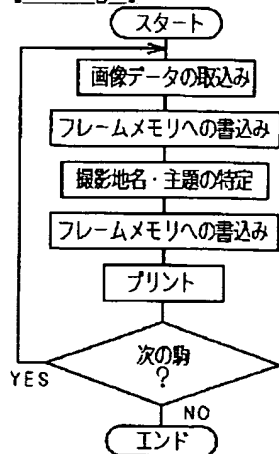
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DRAWINGS

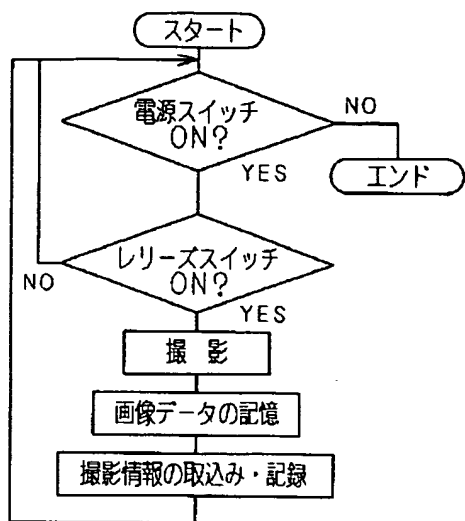
[Drawing 1]



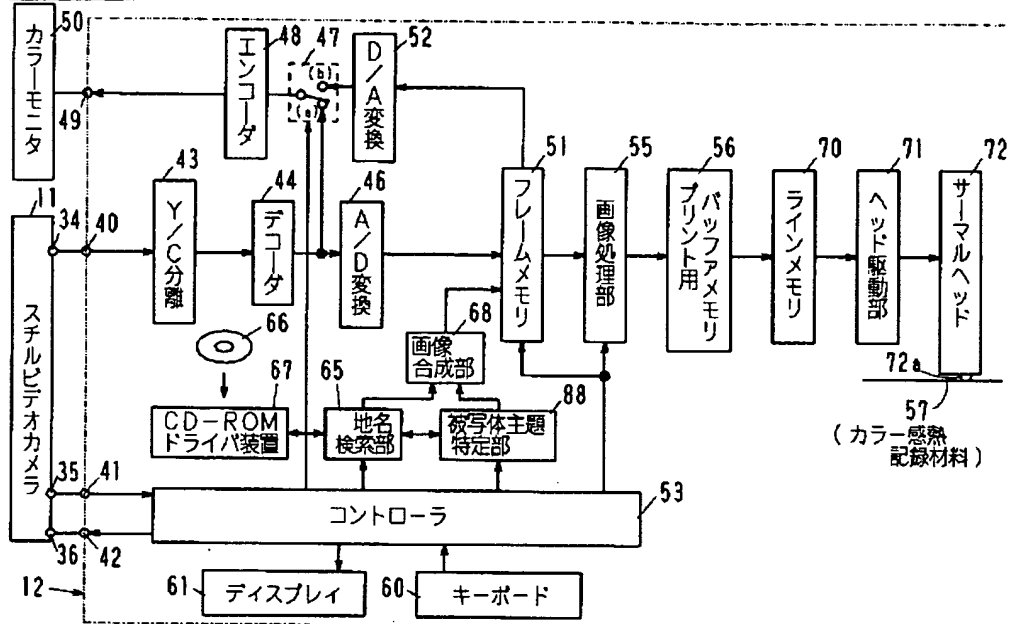
[Drawing 5]



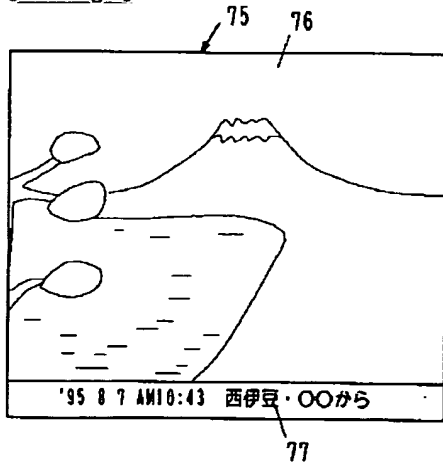
[Drawing 2]



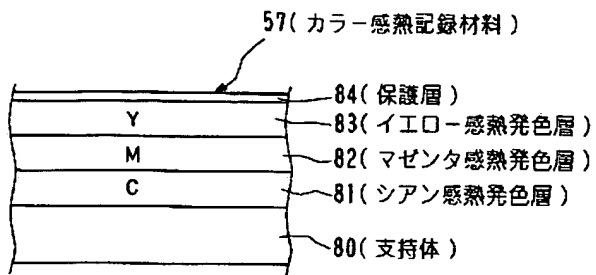
[Drawing 3]



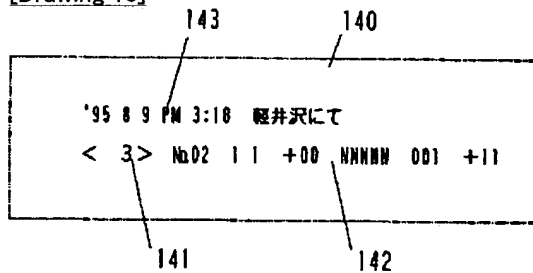
[Drawing 4]



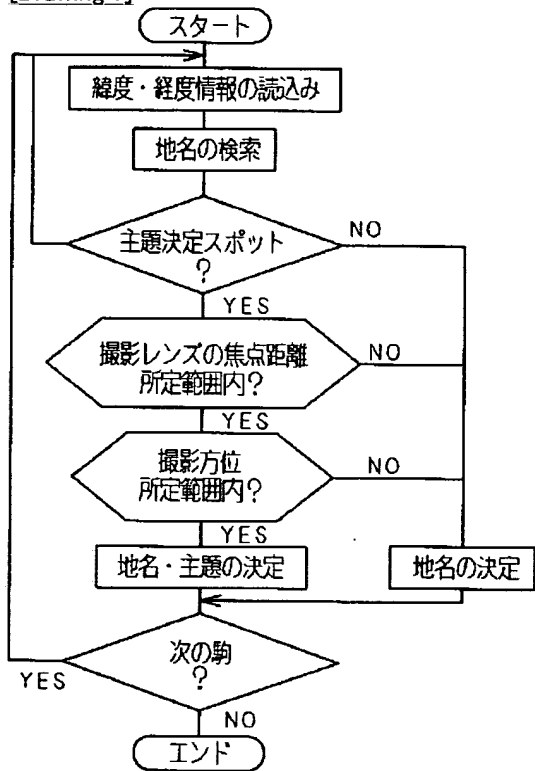
[Drawing 6]



[Drawing 10]



[Drawing 7]



[Drawing 8]

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